

**Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services**

STATEMENT OF BASIS

Union Carbide Corporation – Taft Star Plant

Unit 8

Initial Part 70 Permit

Taft, St. Charles Parish, Louisiana

Agency Interest Number: 2083

Activity Number: PER19960020

Draft Permit 2446-V0

I. APPLICANT:

Company:

Union Carbide Corporation
P.O. Box 50
Hahnville, LA 70057

Facility:

Union Carbide Corp – Taft Star Plant
355 Highway 3142 Gate 28 in Taft, St. Charles Parish, Louisiana

II. FACILITY AND CURRENT PERMIT STATUS:

Union Carbide Corporation, a wholly owned subsidiary of The Dow Chemical Company, proposes to permit its chemical manufacturing facility located in Taft, St. Charles Parish under the Part 70 Operating Permit Program. Unit 8 (EXP), located within the Taft Star Plant, was first permitted December 5, 1996, under State Permit 2446. Changes to plant operation have been documented through Administrative Changes (September 16, 1998, November 11, 1998, and May 16, 1999), Authorizations to Construct (March 4, 1999), Small Source Exemptions (June 11, 1999, and March 14, 2000), Case-by-Case Insignificant Activities (June 30, 2003, December 8, 2003, March 18, 2004, and February 2, 2005), and Administrative Amendment.

III. PROPOSED PERMIT/PROJECT INFORMATION:

Proposed Permit

Union Carbide Corporation submitted an application and Emission Inventory Questionnaire (EIQ) dated July 18, 2005, requesting an Initial Title V operating permit with modifications. The July 18, 2005 application and EIQ replaced the original application submitted October 12, 1996 and revisions submitted April 4, 2000, and September 4, 2002. Additional information dated October 24, 2005 was also received.

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Project Description

Unit 8 was originally permitted for construction in 1996. The facility is an alkoxylation production unit that was designed to produce surfactants, amine ethoxylates, and polyethylene glycols (PEG). There are two primary products generated in the unit—surfactants and polyethylene glycol. The primary feedstocks are alcohol ethoxylates, ethylene oxide (from the UCC Ethylene Oxide Units), and diethylene glycol. These raw materials are fed to reactors to produce various products which are then packaged or shipped off-site via railcar, tank truck, box truck, or drums.

Surfactants

The Ethoxylates Park Surfactant Reactors are utilized for the production of surfactants. The reaction process begins by loading the desired amount of starter (alcohol ethoxylates) to the reactor. A base material is then added to the reactor as a catalyst for the reaction. Nitrogen sparging is done to reduce the water content of the starter material. Ethylene Oxide (EO) is fed to the reactor and the reaction begins. Once the reaction has been completed, it is neutralized with acid to ensure the reaction has stopped and to stabilize the product. The end product is then transferred to a rail car.

Several of the higher molecular weight surfactants are sold as “aqueous” blends (“aqueous” is defined as having added water to prevent freezing) due to the freezing potential of the neat surfactant.

HEP production is similar in the charge and discharge and EO feed phase, but no catalyst of neutralizing acid is used since it is a water catalyzed reaction. Water is included in the Piperazine raw material that is supplied on site.

Polyethylene Glycol

The Polyethylene Glycol (PEG) reaction system is utilized for the production of high and low molecular weight PEGs. The reaction process begins by feeding diethylene glycol to the reactor. Caustic is added to provide a catalyst for the reaction. Water is removed from the system by nitrogen sparging. Ethylene oxide is then fed to the reactor. This reaction will yield either a PEG starter material or a low molecular weight product. The low molecular weight product is neutralized in the reactor. PEG starter is used to produce the neat higher molecular weight PEG products. These products are either aqueous blends or solid materials. PEG starter can be

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further catalyzed, reacted with ethylene oxide, and neutralized.

MPEGs are the product of a reaction similar to the PEG reaction with the exception that MPEGs are a product of reacting Methyl CARBITOL® and ethylene oxide.

Various upgrades and additions have been made to the unit over the years. These include:

- A vacuum jet system used at the surfactant reactors;
- A new baghouse project; and
- The SPOGONA project.

Based on the information provided in the most recent revised application, the initial Title V permit will incorporate and define emission points designated in the existing state permit and additional emission points that have been permitted since 1996 through Small Source Exemptions or Authorizations to Construct. This permit includes the following updated information:

- Speciation of TAPs;
- Updates to emission estimates for tanks, fugitives, flares, loading, unloading, sparging, heating, and scrubber emissions;
- Incorporation of emissions associated with the Small Source Exemption granted June 11, 1999, for the jet system;
- Incorporation of a Storage Bin CAP (Bin Vent CAP) for the four new storage bins (EQI numbers 3926, 3927, 3928, and 3929) that were added to the State Permit via an administrative change (requested September 16, 1998);
- Incorporation of the new baghouse associated with the Authorization-to-Construct and Approval to Operate on March 4, 1999;
- Incorporation of revised fugitive emission component counts;
- Incorporation of the emission changes associated with the SPOGONA Project as listed in the Case-by-Case Insignificant Activity request;
- Tank capacity changes resulting from a correction in tank heights (note: no new state or federal regulations were triggered due to the capacity changes);
- Addition of glycol ethers (II-S) service for storage tank C-521, EI 3910 (tank will have the flexibility to store polyethylene glycol and glycol ethers);
- Addition of an Octyl Phenol and Nonyl Phenol Unloading CAP (EI 3920);
- Throughput increase for Acetic Acid Tank C-509 (EI 3906) per Administrative Amendment dated September 27, 2004;
- Throughput change for the following tanks:

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1. Tank C-509 (EIQ 3906) – change from 304,000 lbs/yr to 500,000 lbs/yr
 2. Tank C-807 (EIQ 3914) – change from 25,139,000 lb/yr to 40,000,000 lbs/yr
 3. Tank C-901 (EIQ 3915) – change from 10,015,000 lb/yr to 40,000,000 lbs/yr
 4. Tank C-904 (EIQ 3916) – change from 39,999,999 lb/yr to 40,000,000 lbs/yr
- Addition of Mobile Drumming Operations, EIQ 3940;
 - Removal of PEG service from tank C-807 (EIQ 3914);
 - Removal of Tanks C-403 (EIQ 3905), C-509 (EIQ 3906), and C-517 (EIQ 3909) from the Emission Point list. These tanks are considered to be Insignificant Activities;
 - Deletion of the following sources: Drum Unloading (EIQ 3919), Spray Congealer Feed Line Vent (EIQ 3937), and Degasser Pot (EIQ 3939).

Permitted Air Emissions

Estimated changes in the permitted emissions from the Utility Unit in tons per year are as follows:

Pollutant	Permitted Before	Permitted After	Permitted Change
PM10	0.27	1.61	+1.34
NOx	0.05	0.05	-
SO2	5.59	5.59	-
CO	30.40	30.40	-
VOC ¹	6.0	25.38	+19.38

¹VOC speciation in tons per year:

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LAC 33:III Toxic Air Pollutants (TAPs)	Before	After	Change
Acetaldehyde	-	0.06	+0.06
Diethylene ether (1,4-Dioxane)	<0.01	<0.01	-
Ethylene Glycol	0.003	0.09	+0.087
Ethylene Oxide	0.22	1.12	+0.90
Formaldehyde	-	0.02	+0.02
Glycol Ethers (II-S)	0.44	4.03	+3.59
Total	0.66	5.32	+4.66

Prevention of Significant Deterioration Applicability (PSD)

PM₁₀, SO₂, NO_x, CO, and VOC emissions are below the significance threshold values and not applicable to PSD requirements.

MACT Requirements

Union Carbide Corp – Taft Star Plant is a major source of LAC 33:III.Chapter 51 regulated toxic air pollutants (TAPs). Unit 8 emits Class I, II, and III TAPs; therefore, MACT requirements apply to various emission points.

Air Modeling Analysis

Air modeling analysis is not required.

General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General condition XVII Activities are not subject to testing, monitoring, reporting, or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

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Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

Regulatory Analysis

This application was reviewed for compliance with the Louisiana Part 70 operating permit program, Louisiana Air Quality Regulations, Louisiana Comprehensive Toxic Air Pollutant (TAP) Emission Control Program, New Source Performance Standards (NSPS), NESHAP, Compliance Assurance Monitoring (CAM) and Prevention of Significant Deterioration (PSD) regulations. CAM and PSD do not apply.

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or where provided, in Tables 1 and 2 of the draft permit. Similarly, the Monitoring, Reporting, and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions, and standards are provided in the Facility Specific Requirements Section of the draft permit.

IV. PERMIT SHIELDS

A permit shield is not a component of the draft permit.

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V. PERIODIC MONITORING

Compliance Assurance Monitoring (40 CFR 64) does not apply since the major source units do not have the potential to emit greater than 100 tons of a regulated air pollutant before controls.

VI. APPLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS		
ID No:	Requirement	Notes
Unit 8 (EXP)	National Emission standards for Organic Hazardous Air Pollutants From the Synthetic Organic Chemical Manufacturing Industry [40 CFR 63 Subpart F]	DOES NOT APPLY. Polyethylene glycol was delisted from NESHAPs Subpart F, Table 1, 6/21/96. Therefore, this unit does not produce as a primary product a chemical on the Table 1 list.
	NSPS Subpart NNN – Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations [40 CFR 60.660-60.668]	DOES NOT APPLY. Unit 8 does not have distillation columns.
EQT 479 Reactor C-1101, EQT 480 Reactor C-1201, EQT 481 Reactor C-1301	NSPS Subpart RRR – Standards of Performance for Volatile Organic Compound (VOC) Emissions from the Synthetic Organic Chemical Manufacturing Industry (SOCMI) Reactor Processes [40 CFR 60.700-60.708]	DOES NOT APPLY. Unit 8 does not produce chemicals on the 40 CFR 60.707 list.
EQT 483 Tank C-511, EQT 489 Tank C-807, EQT 490 Tank C-901, EQT 491 Tank C-904, EQT 492 Tank C-907	National Emission standards for Hazardous Air Pollutant Emissions for Polyether Polyols Production [40 CFR 63 Subpart PPP]	DOES NOT APPLY. Tanks are Group 2 storage vessels with capacities greater than 39,890 gallons and vapor pressures less than 0.75 psia. Comply with the recordkeeping requirements of 40 CFR 63.123. [40 CFR 63.1432(a)]
	NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. [40 CFR 60.110b]	DOES NOT APPLY. Storage tanks have a capacity greater than 39,890 gallons and vapor pressures less than 0.51 psia.

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EQT 483 Tank C-511, EQT 489 Tank C-807, EQT 490 Tank C-901, EQT 491 Tank C-904, EQT 492 Tank C-907	Control of Emissions of Organic Compounds: Storage of Volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tanks store VOCs with a vapor pressure less than 1.5 psia.
EQT 484 Tank C-514, EQT 485 Tank C-521	NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. [40 CFR 60.110b]	DOES NOT APPLY. Storage tanks have a capacity less than 39,890 gallons and vapor pressures greater than 2.17 psia.
	Control of Emissions of Organic Compounds: Storage of Volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tanks store VOCs with a vapor pressure less than 1.5 psia.
EQT 486 Tank C-527, EQT 487 Tank C-536, EQT 488 Tank C-539	National Emission standards for Hazardous Air Pollutant Emissions for Polyether Polyols Production [40 CFR 63 Subpart PPP]	DOES NOT APPLY. Tanks function as surge control vessels and do not meet the definition of a storage vessel. [40 CFR 63.1423]
	NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984. [40 CFR 60.110b]	DOES NOT APPLY. Storage tanks have a capacity less than 39,890 gallons and vapor pressures less than 2.17 psia.
	Control of Emissions of Organic Compounds: Storage of Volatile Organic Compounds [LAC 33:III.2103]	DOES NOT APPLY. Tanks store VOCs with a vapor pressure less than 1.5 psia.
EQT 493 Packaging and Drumming Operations	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at these sources.
	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The materials packaged do not emit TAPs. No MACT is required.

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ID No:	Requirement	Notes
GRP 97 Octyl Phenol and Nonyl Phenol Unloading CAP (EQT 494 – EQT 503), EQT 505 Unloading Operations #2, EQT 517 Decanter Unloading	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at these sources. LAC 33:III.2107 does not address unloading operations.
	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The materials packaged do not emit TAPs. No MACT is required.
EQT 504 Loading Operations #1, EQT 506 Loading Operations #2	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at these sources.
EQT 508 Piperazine Scrubber	National Emission standards for Hazardous Air Pollutant Emissions for Polyether Polyols Production [40 CFR 63 Subpart PPP]	DOES NOT APPLY. Does not meet the definition of a process vent. Does not emit a gaseous emission stream containing more than 0.005 weight percent total organic HAP. Does not emit HAPs. [40 CFR 63.1425]
	Control of Emissions of Organic Compounds: Waste Gas Disposal [LAC 33:III.2115]	EXEMPT. Waste gas stream has a combined weight of VOCs equal to or less than 100 pounds (25.4 kg) in any continuous 24-hour period. [LAC 33:III.2115.H.1.c] Records to demonstrate that the criteria are being met for any exemption claimed must be maintained. [LAC 33:III.2115.K.4]

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ID No:	Requirement	Notes
EQT 508 Piperazine Scrubber	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The vent does not emit TAPs. No MACT is required.
EQT 520 Acetic Acid Scrubber	National Emission standards for Hazardous Air Pollutant Emissions for Polyether Polyols Production [40 CFR 63 Subpart PPP]	DOES NOT APPLY. Does not meet the definition of a process vent. Does not emit a gaseous emission stream containing more than 0.005 weight percent total organic HAP. Scrubber is used for acetic acid tank filling, which contains only trace amounts of HAPs as impurities. [40 CFR 63.1425]
	Control of Emissions of Organic Compounds: Waste Gas Disposal [LAC 33:III.2115]	EXEMPT. Waste gas stream has a combined weight of VOCs equal to or less than 100 pounds (25.4 kg) in any continuous 24-hour period. [LAC 33:III.2115.H.1.c] Records to demonstrate that the criteria are being met for any exemption claimed must be maintained. [LAC 33:III.2115.K.4]
EQT 509 – EQT 512 Product Storage Bins D-413, 414, 415, 416	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at these sources.
	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The vent does not emit TAPs. No MACT is required.
EQT 513 Solid Filling Station, EQT 518 Solid Filling Station #2	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at these sources.
	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The vent does not emit TAPs. No MACT is required.

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ID No:	Requirement	Notes
EQT 519 Congealer Vent	National Emission standards for Hazardous Air Pollutant Emissions for Polyether Polyols Production [40 CFR 63 Subpart PPP]	DOES NOT APPLY. Does not meet the definition of a process vent. Does not emit a gaseous emission stream containing more than 0.005 weight percent total organic HAP. Does not emit HAPs. [40 CFR 63.1425]
	Control of Emissions of Organic Compounds: Waste Gas Disposal [LAC 33:III.2115]	DOES NOT APPLY. The material vented is a solid not a waste gas stream.
	Comprehensive Toxic Air Pollutant Emission Control Program: Emission control and Reduction Requirements and Standards [LAC 33:III.5109]	DOES NOT APPLY. The vent does not emit TAPs. No MACT is required.
EQT 521 Mobile Drumming	Volatile Organic Compounds – Loading [LAC 33:III.2107]	DOES NOT APPLY. There are no products with a VOC true vapor pressure greater than 1.5 psia loaded at this source.

VII. STREAMLINED REQUIREMENTS			
Unit or Plant Site	Programs Being Streamlined	Stream Applicability	Overall Most Stringent Program
Unit 8 (EXP)	40 CFR 60 Subpart VV		40 CFR 63 subpart H (as referenced by 40 CFR 63 Subpart PPP)
	40 CFR 63 Subpart PPP		
	LAC 33:III.2121		
	40 CFR 63 subpart H (as referenced by 40 CFR 63 Subpart PPP)		

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Glossary

CAM - Compliance Assurance Monitoring rule – A federal air regulation under 40 CFR Part 64

Carbon Monoxide (CO) – A colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

Federally Enforceable Specific Condition - A federally enforceable specific condition written to limit the Potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Monomer – A simple compound whose molecules can join together to form polymers.

NESHAP - National Emission Standards for Hazardous Air Pollutants – Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

Nitrogen Oxides (NO_x) - Compounds whose molecules consist of nitrogen and oxygen.

NSPS - New Source Performance Standards – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH₄), Ethane (C₂H₆), Carbon Disulfide (CS₂)

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Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM₁₀- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Polymer – A naturally occurring or synthetic compound consisting of large molecules made up of a linked series of repeated simple monomers.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO₂) – An oxide of sulphur.

TAP - Toxic Air Pollutant - LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3.

Title V permit – See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.